

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/AU00/00839

**A. CLASSIFICATION OF SUBJECT MATTER**

Int. Cl. <sup>7</sup>: G02B 5/28, 6/13, 6/34

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC: G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
DWPI, JAPIO

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5768454 A (CHESNOY ET AL.) 16 June 1998 Column 2 line 35 to column 4 line 67, Figures 1, 3	1-4, 15-25, 28, 32, 34, 35
X	WO 97/30365 A (CORNING INCORPORATED) 21 August 1997 Page 3 line 8 to page 5 line 29, page 7 line 29 to page 8 line 9, Figures 1, 6	1-2, 7-10, 21-23, 25, 32, 35
X	US 5367588 A (HILL ET AL.) 22 November 1994 Column 3 line 36 to column 6 line 30, Figures 1-4	1-4, 21, 23-25, 32, 35

☒ Further documents are listed in the continuation of Box C ☒ See patent family annex

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance  
 "E" earlier application or patent but published on or after the international filing date  
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  
 "O" document referring to an oral disclosure, use, exhibition or other means  
 "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone  
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art  
 "&" document member of the same patent family

Date of the actual completion of the international search  
24 August 2000

Date of mailing of the international search report  
1 SEP 2000

Name and mailing address of the ISA/AU

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU00/00839

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	Optics Communications, Vol. 171, December 1999 (Elsevier), J. Canning, M G Sceats, and S Fleming, "Grating structures with phase mask period in silica-on-silicon planar waveguides", pp. 213-217 Whole document	1-4, 9-10, 21, 23-25, 28, 32, 34-35
A	US 5335548 A (KALIBJIAN) 9 August 1994 Whole document	1-42

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
**PCT/AU00/00839**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
US	5768454	AU	75486/96	CA	2194005	EP	782018
		FR	2742881	JP	9189819		
WO	9730365	AU	21181/97	CA	2255061	CN	1216116
		EP	883827	US	5668901		
US	5367588	CA	2087511	DE	4337103	FR	2697642
		GB	2272075	JP	7140311		
US	5335548	NONE					
END OF ANNEX							

REC'D 13 NOV 2001

PCT

Applicant's or agent's file reference AH:DGC:KRA:FP12964	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. <b>PCT/AU00/00839</b>	International Filing Date ( <i>day/month/year</i> ) 11 July 2000	Priority Date ( <i>day/month/year</i> ) 15 July 1999
International Patent Classification (IPC) or national classification and IPC  Int. Cl. <sup>7</sup> G02B 5/28, 6/13, 6/34		
Applicant  THE UNIVERSITY OF SYDNEY et al		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.																
2.	<p>This REPORT consists of a total of 3 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 11 sheet(s).</p>																
3.	<p>This report contains indications relating to the following items:</p> <table border="0"> <tr> <td>I</td> <td><input checked="" type="checkbox"/> Basis of the report</td> </tr> <tr> <td>II</td> <td><input type="checkbox"/> Priority</td> </tr> <tr> <td>III</td> <td><input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td>IV</td> <td><input type="checkbox"/> Lack of unity of invention</td> </tr> <tr> <td>V</td> <td><input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td>VI</td> <td><input type="checkbox"/> Certain documents cited</td> </tr> <tr> <td>VII</td> <td><input type="checkbox"/> Certain defects in the international application</td> </tr> <tr> <td>VIII</td> <td><input type="checkbox"/> Certain observations on the international application</td> </tr> </table>	I	<input checked="" type="checkbox"/> Basis of the report	II	<input type="checkbox"/> Priority	III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	IV	<input type="checkbox"/> Lack of unity of invention	V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	VI	<input type="checkbox"/> Certain documents cited	VII	<input type="checkbox"/> Certain defects in the international application	VIII	<input type="checkbox"/> Certain observations on the international application
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Date of submission of the demand 12 February 2001	Date of completion of the report 26 October 2001 - 9 NOV 2001
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  <b>MICHAEL HALL</b> Telephone No. (02) 6283 2474

**I. Basis of the report****1. With regard to the elements of the international application:\***

- ☐ the international application as originally filed.
- ☒ the description, pages **2, 5-18**, as originally filed,  
pages , filed with the demand,  
pages **1, 1a, 3, 4, 4a**, received on **27 September 2001** with the letter of **25 September 2001**
- ☒ the claims, pages , as originally filed,  
pages , as amended (together with any statement) under Article 19,  
pages , filed with the demand,  
pages **19-24**, received on **27 September 2001** with the letter of **25 September 2001**
- ☒ the drawings, pages **1-12**, as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

**4. The amendments have resulted in the cancellation of:**

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

**5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims 1-40	YES
	Claims	NO
Inventive step (IS)	Claims 1-40	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-40	YES
	Claims	NO

**2. Citations and explanations (Rule 70.7)**

Citations

D1 : US 5768454

D2 : US 5367588

NOVELTY (N) AND INVENTIVE STEP (IS)

D1 and D2 represent the closest prior art, where each teaches forming a first-order Bragg grating in an optical fibre by dividing a coherent beam into a zero-order and two first-order components via a phase mask, and focussing the components on the optic fibre to write the grating structure (eg, column 2 line 25 to column 4 line 65, Figures 1 and 3 of D1; column 3 line 36 to column 4 line 65, Figures 1-2 of D2).

However, no obvious combination of D1 and D2 teaches or suggests (i) modulating/adjusting the relative phase of at least one of the beams, and (ii) forming a grating structure comprising superimposed gratings of different order, as per independent claims 1, 13 and 19. Hence these claims, and consequently dependent claims 2-12, 14-18 and 20-40, are novel and inventive over the prior art.

INDUSTRIAL APPLICABILITY (IA)

The subject matter of the claims is applicable to the industrial manufacture of waveguide gratings.

# PATENT COOPERATION TREATY

**PCT**

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
US Department of Commerce  
United States Patent and Trademark  
Office, PCT  
2011 South Clark Place Room  
CP2/5C24  
Arlington, VA 22202  
ETATS-UNIS D'AMERIQUE  
in its capacity as elected Office

Date of mailing (day/month/year) 08 March 2001 (08.03.01)	
International application No. PCT/AU00/00839	Applicant's or agent's file reference
International filing date (day/month/year) 11 July 2000 (11.07.00)	Priority date (day/month/year) 15 July 1999 (15.07.99)
Applicant CANNING, John	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
12 February 2001 (12.02.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Claudio Borton Telephone No.: (41-22) 338.83.38
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